

WHAT IS CLAIMED IS:

1. A method of recovering management of one or more network elements, said method comprising:

monitoring operation of a plurality of distributed gateways, each of said gateways responsible for managing one or more network elements;

5 detecting failure of one of said distributed gateways; and

responsive to said detecting step, recovering management of said one or more network elements for which said failed gateway had management responsibility by assigning management responsibility to at least one other of said plurality of distributed gateways.

2. The method of claim 1 wherein said managing one or more network elements includes translating a communication protocol utilized by said one or more network elements.

3. The method of claim 1 wherein said plurality of distributed gateways are communicatively coupled to a processor-based management system.

4. The method of claim 3 further comprising the step of:
said management system controlling said recovering step.

5. The method of claim 1 wherein one or more gateway monitoring systems are communicatively coupled to said plurality of distributed gateways, further comprising the step of:

 said one or more gateway monitoring systems performing said detecting step.

6. The method of claim 5 wherein said detecting step further includes the step of:
 said one or more gateway monitoring systems polling said plurality of distributed gateways.

7. The method of claim 5 further comprising the step of:
said one or more gateway monitoring systems controlling said recovering step.

8. The method of claim 1 further comprising the step of:
determining management activities for which a detected failed gateway is responsible
for performing.

9. The method of claim 8 further comprising the step of:
determining one or more available gateways from said plurality of distributed
gateways, which are available for assuming at least a portion of said management activities of
said detected failed gateway.

10. The method of claim 9 wherein said one or more available gateways are a
subset of said plurality of distributed gateways.

11. The method of claim 9 wherein said available gateways are gateways local to
said detected failed gateway.

12. The method of claim 9 further comprising the step of:
grouping two or more of said plurality of distributed gateways.

13. The method of claim 12 wherein said step of determining one or more
available gateways, includes determining gateways that are included in a common grouping
with said detected failed gateway.

14. The method of claim 12 wherein said grouping is predetermined based at least
in part on a criteria selected from the group consisting of:
gateway communication protocol, gateway location, and any user-defined criteria.

15. The method of claim 9 wherein said recovering step further includes the step of:

distributing said management activities of said detected failed gateway to at least one of said one or more available gateways.

16. The method of claim 15 wherein said distributing step further includes the steps of:

determining operational load of said available gateways; and

5 performing load balancing in distributing said management activities to said at least one of said one or more available gateways.

17. The method of claim 16 wherein said load balancing is performed autonomously by a processor-based system.

18. The method of claim 17 wherein said load balancing further comprises the steps of:

determining the operational load for each of said management activities; and

allocating said management activities to one or more of said available gateways in a

5 manner that approximately balances each of their operational loads.

19. The method of claim 18 wherein said operational load of said available gateways is determined dynamically, and allocation of said management activities is determined based at least in part on said determined operational load of said available gateways.

20. The method of claim 17 wherein said load balancing is performed according to a greedy algorithm.

21. The method of claim 8 wherein said recovering step further includes the step of:

distributing said management activities of said detected failed gateway to at least one other of said plurality of distributed gateways.

22. The method of claim 21 wherein said distributing step is autonomously performed by a processor-based system.

23. The method of claim 21 wherein said distributing step further includes the steps of:

determining operational load of said available gateways; and

performing load balancing in distributing said management activities to said at least one other of said plurality of distributed gateways.

24. The method of claim 1 wherein said plurality of distributed gateways are operable to translate a plurality of different communication protocols.

25. The method of claim 1 further comprising the step of:

user predefining at least one of said plurality of distributed gateways to be used in recovering management of one or more network elements for which a particular one of said plurality of distributed gateways has management responsibility in the event of a failure of said particular one of said plurality of distributed gateways.

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26. The method of claim 1 further comprising the step of:

user predefining criteria to be used in recovering management of one or more network elements in the event of a failure of one of said plurality of distributed gateways.

27. A system comprising:

plurality of network elements;

plurality of distributed gateways each communicatively coupled to one or more of said plurality of network elements, wherein each of said plurality of distributed gateways is responsible for managing one or more of said plurality of network elements;

5 gateway monitoring system communicatively coupled to said plurality of distributed gateways, wherein said gateway monitoring system is operable to detect failure of at least one of said distributed gateways; and

management recovery system communicatively coupled to said plurality of distributed gateways, wherein said management recovery system is operable to autonomously recover management of said one or more network elements for which a detected failed gateway had management responsibility.

28. The system of claim 27 wherein said management recovery system is operable to assign management responsibility of said one or more network elements for which said detected failed gateway had management responsibility to at least one other of said plurality of distributed gateways.

29. The system of claim 27 wherein said managing one or more of said network elements includes translation of a communication protocol utilized by said one or more network elements.

30. The system of claim 27 wherein said gateway monitoring system and said management recovery system are integrated on a common platform.

31. The system of claim 27 wherein said gateway monitoring system is operable to poll said plurality of distributed gateways.

32. The system of claim 27 wherein said management recovery system is operable to determine management activities for which said detected failed gateway is responsible for performing.

33. The system of claim 32 wherein said management recovery system is operable to determine one or more available gateways from said plurality of distributed gateways, which are available for assuming at least a portion of said management activities of said detected failed gateway.

34. The system of claim 33 wherein said one or more available gateways are a subset of said plurality of distributed gateways.

35. The system of claim 33 wherein said available gateways are gateways local to said detected failed gateway.

36. The system of claim 33 wherein said available gateways are gateways operable to translate a common communication protocol as said detected failed gateway.

37. The system of claim 33 wherein said management recovery system is further operable to distribute said management activities of said detected failed gateway to at least one of said one or more available gateways.

38. The system of claim 37 wherein said management recovery system is operable to determine operational load of said available gateways, and perform load balancing in distributing said management activities to said at least one of said one or more available gateways.

39. The system of claim 38 wherein in performing said load balancing said management recovery system is operable to determine the operational load for each of said management activities, and allocate said management activities to one or more of said available gateways in a manner that approximately balances each of their operational loads.

40. The system of claim 38 wherein said management recovery system further comprises:

software code executable by said management recovery system, said software code implementing a greedy algorithm for controlling said load balancing.

41. The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface for alerting a user of said detected failed gateway.

42. The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface that enables a user to predefine at least one of said plurality of distributed gateways to be used in recovering management of one or more network elements for which a particular one of said plurality of distributed gateways has management responsibility in the event of a failure of said particular one of said plurality of distributed gateways.

43. The system of claim 27 wherein said management recovery system further comprises:

software code executable by said management recovery system to present a user interface that enables a user to predefine criteria to be used in recovering management of one or more network elements in the event of a failure of one of said plurality of distributed gateways.

44. A system for recovering management of one or more network elements responsive to failure of a distributed gateway, said system comprising:
plurality of distributed gateways, each for managing one or more network elements;
means communicatively coupled to said plurality of distributed gateways for detecting
failure of any one of said distributed gateways; and
5 means, responsive to detection of failure of one of said distributed gateways, for
autonomously recovering management of one or more network elements for which the
detected failed gateway had management responsibility.

45. The system of claim 44 wherein the means for autonomously recovering management comprises logic for assigning management responsibility of said one or more network elements for which said detected failed gateway had management responsibility to at least one other of said plurality of distributed gateways.

46. The system of claim 45 wherein said logic includes software code executable by said means for autonomously recovering management.

47. The system of claim 44 wherein said managing one or more network elements includes translation of a communication protocol utilized by said one or more network elements.

48. The system of claim 44 wherein said means for detecting failure comprises logic for polling said plurality of distributed gateways.

49. The system of claim 48 wherein said logic includes software code executable by said means for detecting failure.

50. The system of claim 44 further comprising:
means for determining management activities for which said detected failed gateway
is responsible for performing.

51. The system of claim 50 further comprising:
means for determining one or more available gateways from said plurality of
distributed gateways, which are available for assuming at least a portion of said management
activities of said detected failed gateway.

52. The system of claim 51 wherein said one or more available gateways are a
subset of said plurality of distributed gateways.

53. The system of claim 51 wherein said available gateways are determined as
gateways local to said detected failed gateway.

54. The system of claim 51 wherein said available gateways are determined as
gateways operable to translate a common communication protocol as said detected failed
gateway.

55. The system of claim 51 wherein said means for autonomously recovering
management comprises logic for allocating said management activities of said detected failed
gateway to at least one of said one or more available gateways.

56. The system of claim 55 further comprising:
means for determining operational load of said available gateways, wherein said
means for autonomously recovering management comprises logic for performing load
balancing in allocating said management activities to said at least one of said one or more
available gateways.

57. The system of claim 56 further comprising:

means for determining the operational load for each of said management activities,
wherein said means for autonomously recovering management comprises logic for allocating
said management activities to one or more of said available gateways in a manner that
approximately balances each of their operational loads.

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